IN THE CLAIMS

Claims 5, 6 and 23 are amended. Claim 7 is canceled. Claims 34-57 are added. The following is a complete claim listing showing current status:

1. (Original) A method of methanol steam reforming comprising:

contacting methanol and water vapor with a catalyst;

wherein the catalyst comprises a palladium on zinc oxide catalyst

wherein said catalyst has a pore volume and at least 20% of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 microns; and

forming hydrogen from the reaction of said methanol and water vapor at a rate of at least 1.5 mole methanol per gram catalyst per hour (1.5 mole methanol / (g catalyst)(hr)).

2. (Canceled)

3. (Canceled)

4. (canceled)

5. (Currently Amended) A method of alcohol steam reforming comprising:

contacting methanol and water vapor with a catalyst with a contact time of less than 1s in a reaction chamber having a width less than 2 mm;

wherein the catalyst comprises palladium or ruthenium on cerium-promoted zirconia or alumina; and

forming hydrogen from the reaction of said methanol and water vapor;

wherein the methanol conversion is at least 80% and the H_2 selectivity is at least 50%.

6. (Currently Amended) A method of alcohol steam reforming comprising:

contacting methanol and water vapor with a catalyst with a contact time of less than 1s;

wherein the catalyst comprises a palladium-ruthenium alloy on zirconia or alumina;

wherein the catalyst comprises a higher weight percent of palladium than of ruthenium;

and

forming hydrogen from the reaction of said methanol and water vapor;

wherein the methanol conversion is at least 80% and the H_2 selectivity is at least 60%.

7. (Canceled)

8. (Previously Presented) The method of claim 1 wherein the catalyst comprises 2 to 10 weight percent Pd.

9. (Previously Presented) The method of claim 1 wherein the ZnO forms a layer having a thickness of less than 40 μm on a large pore support.

10. (Previously Presented) The method of claim 1 wherein the catalyst comprises a large pore support wherein the support comprises a metal foam or metal felt.

11. (Previously Presented) The method of claim 1 wherein the catalyst has a pore volume of 30 to 95%.

12. (Previously Presented) The method of claim 11 wherein at least 50% of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 microns.

13. (Previously Presented) The method of claim 1 wherein at least 50% of the catalyst's pore volume is composed of pores in the size range of 0.3 to 200 microns.

14. (Previously Presented) The method of claim 1 wherein at least 20% of the catalyst's pore volume is composed of pores in the size range of 1 to 100 microns.

15. (Previously Presented) The method of claim 1 wherein the catalyst comprises a

large pore support that has a corrugated shape.

16. (Previously Presented) The method of claim 1 wherein the contact time is less than 1 sec.

17. (Previously Presented) The method of claim 1 wherein the contact time is in the range of 10 to 500 msec.

18. (Previously Presented) The method of claim 17 wherein the step of contacting methanol and water vapor with a catalyst is conducted at a temperature of 200 to 500 °C.

19. (Previously Presented) The method of claim 16 wherein the step of contacting methanol and water vapor with a catalyst is conducted at a temperature of 200 to 500 °C.

20. (Previously Presented) The method of claim 19 wherein methanol conversion is at least 50%.

21. (Previously Presented) The method of claim 1 wherein the catalyst is disposed in a reaction chamber in a flow-by configuration.

22. (Previously Presented) The method of claim 1 wherein the catalyst is disposed in a reaction chamber that has a width less than 2 mm; and further wherein the reaction chamber is in thermal contact with a heat exchange chamber.

23. (Currently Amended) The method of claim ~~23~~ 22 wherein the reaction chamber and heat exchange chamber are adjacent and in an interleaved chamber orientation.

24. (Previously Presented) The method of claim 23 wherein the heat exchange

chamber has a width of less than 2 mm.

25. (Previously Presented) The method of claim 21 wherein the catalyst is disposed in a reaction chamber that has a width less than 2 mm; and further wherein the reaction chamber is in thermal contact with a heat exchange chamber.

26. (Previously Presented) The method of claim 25 wherein the catalyst comprises a porous support having a thickness of between 0.1 and 1 mm.

27. (Previously Presented) The method of claim 1 wherein the step of contacting methanol and water vapor with a catalyst is conducted at a temperature of greater than 350 °C.

28. (Previously Presented) The method of claim 18 wherein the step of contacting methanol and water vapor with a catalyst is conducted at a temperature of greater than 350 °C.

29. (Previously Presented) The method of claim 25 wherein the step of contacting methanol and water vapor with a catalyst is conducted at a temperature of greater than 350 °C.

30. (Previously Presented) The method of claim 21 wherein the step of contacting methanol and water vapor with a catalyst is conducted at a temperature of greater than 350 °C; and
wherein the pressure drop through the reaction chamber is 20 psig or less.

31. (Previously Presented) The method of claim 27 wherein the catalyst is disposed in a reaction chamber in a flow through configuration.

32. (Previously Presented) The method of claim 21 wherein the catalyst comprises two pieces separated by a gap.

33. (Previously Presented) The method of claim 32 wherein the reaction chamber that has a width less than 2 mm.

34. (New) The method of claim 5 wherein the CO selectivity is below about 80%.

35. (New) The method of claim 5 wherein the CO selectivity is below about 20%.

36. (New) The method of claim 34 wherein the method is conducted at a temperature of 200 to 500 °C.

37. (New) The method of claim 35 wherein the method is conducted at a temperature of 240 to 400 °C.

38. (New) The method of claim 5 wherein the methanol conversion is at least 90% and the H_2 selectivity is at least 85%.

39. (New) The method of claim 35 wherein the methanol conversion is at least 90% and the H_2 selectivity is at least 85%.

40. (New) The method of claim 38 wherein the catalyst contains 2 to 10 weight % Pd.

41. (New) The method of claim 5 wherein the cerium-promoted zirconia or alumina is a layer of less than 1 mm on a large pore support that has a volumetric average pore size of 0.1 μm or greater.

42. (New) The method of claim 41 wherein the large pore support has a porosity of 30 to 99% and a volumetric average pore size of between 1 and 500 μm.

43. (New) The method of claim 42 wherein the large pore support has a thickness of between 0.1 and 1 mm and the layer of cerium-promoted zirconia or alumina has a thickness of less than 40 μm.

44. (New) The method of claim 5 wherein the catalyst has a pore volume and at least 20% of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 microns.

45. (New) The method of claim 40 wherein the catalyst has a pore volume of 5 to 98% and at least 50% of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 microns.

46. (New) The method of claim 6 wherein the CO selectivity is below about 80%.

47. (New) The method of claim 6 wherein the CO selectivity is below about 20%.

48. (New) The method of claim 46 wherein the catalyst is disposed in a reaction chamber having a width less than 2 mm and wherein the method is conducted at a temperature of 200 to 500 °C.

49. (New) The method of claim 47 wherein the catalyst is disposed in a reaction chamber having a width less than 2 mm and wherein the method is conducted at a temperature of 240 to 400 °C.

50. (New) The method of claim 6 wherein the methanol conversion is at least 90% and the H_2 selectivity is at least 85%.

51. (New) The method of claim 49 wherein the methanol conversion is at least 90% and the

H_2 selectivity is at least 85%.

52. (New) The method of claim 49 wherein the catalyst contains 2 to 10 weight % Pd and 0.2 to 5 weight % Ru.

53. (New) The method of claim 6 wherein the cerium-promoted zirconia or alumina is a layer of less than 1 mm on a large pore support that has a volumetric average pore size of 0.1 μm or greater.

54. (New) The method of claim 52 wherein the large pore support has a porosity of 30 to 99% and a volumetric average pore size of between 1 and 500 μm.

55. (New) The method of claim 52 wherein the large pore support has a thickness of between 0.1 and 1 mm and the layer of cerium-promoted zirconia or alumina has a thickness of less than 40 μm.

56. (New) The method of claim 6 wherein the catalyst has a pore volume and at least 20% of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 microns.

57. (New) The method of claim 51 wherein the catalyst has a pore volume of 5 to 98% and at least 50% of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 microns.